

NEW DISTRIBUTION RECORDS AND RECENT SPREAD OF *HYMENORUS FARRI* CAMPBELL (COLEOPTERA: TENEBRIONIDAE: ALLECULINAE) TO FLORIDA AND IN THE CARIBBEAN REGION

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Abstract.—*Hymenorus farri* Campbell (Coleoptera: Tenebrionidae: Alleculinae) appears to be spreading as a “weed species” in the Caribbean region. The beetle is diagnosed and illustrated. New country distribution records are reported for the Bahamas, Belize, Guatemala, Mexico, Puerto Rico, Turks and Caicos Islands, U.S.A. (Florida), and the Virgin Islands, and additional collections from the Cayman Islands are noted. The occurrences, habitats, biogeography, and uncertain origin of the insect are discussed.

Key Words: adventive insects, Antillean fauna, Caribbean biogeography, comb-clawed beetles, disturbed habitats

Species of *Hymenorus*, a large, monotonous genus of “comb-clawed beetles,” are difficult to identify, but males of *H. farri* Campbell (1971) are distinctive. The species was described and reported from Jamaica, Cuba, and the Cayman Islands (Campbell 1971, 1978) and appeared to be indigenous to those islands. While collecting Tenebrionidae on Grand Cayman in 1993, I became familiar with this beetle and was able to compare specimens with paratypes of *H. farri*. This led to the identification of this *Hymenorus* from earlier and more recent collections from widely scattered localities, reported and discussed below. The beetle is far more widespread than previous records have indicated, and evidence suggests that this species is adventive in some areas, spreading with the aid of anthropogenic activities.

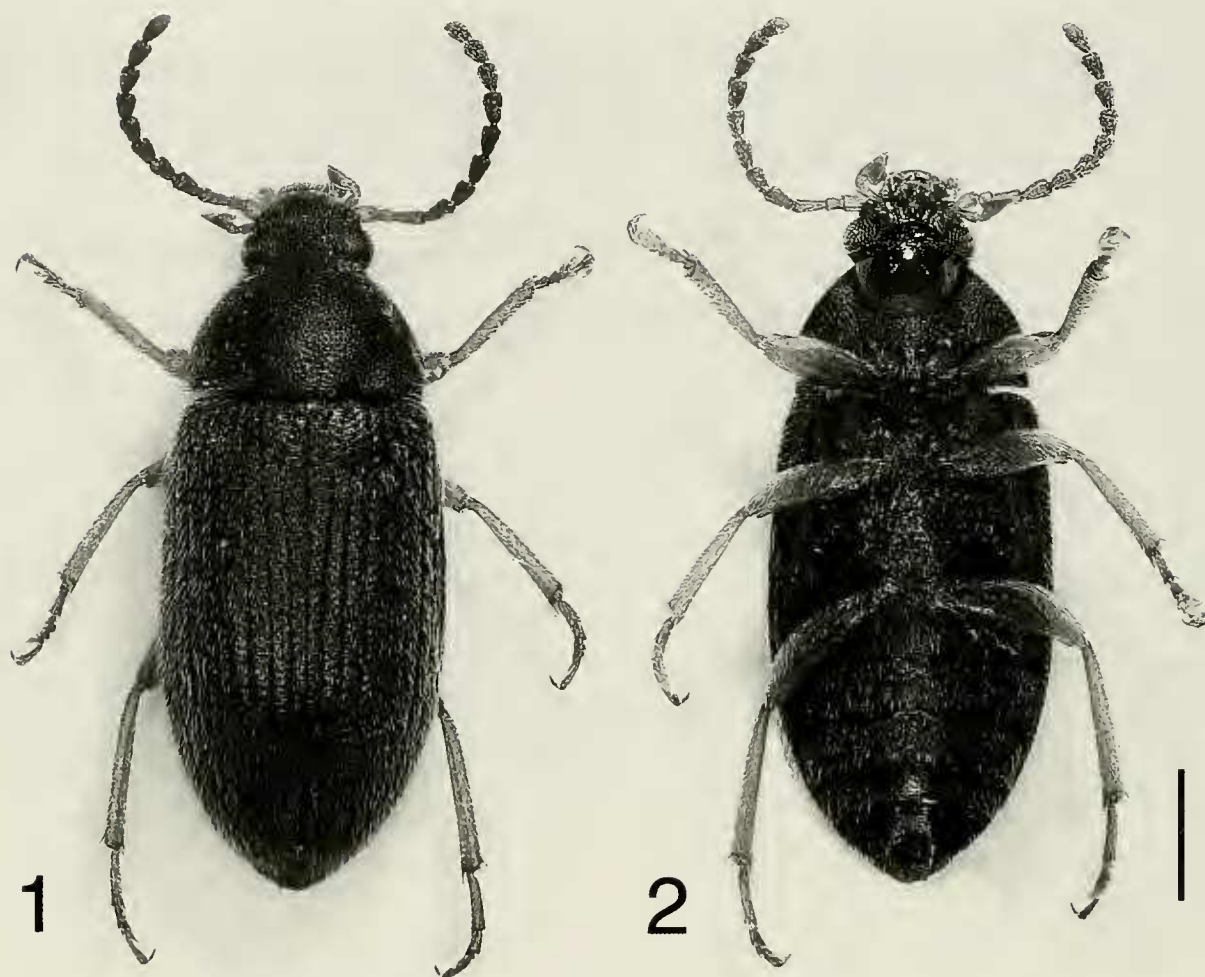
DIAGNOSIS

Hymenorus farri (Figs. 1, 2) is unique among its congeners in having dense median patches of fine setae and punctures on

basal abdominal sternites in males (Fig. 3). Other species have punctures more evenly distributed over these surfaces. This character and the combination of the relatively small and widely separated eyes, robust yellowish legs and tarsi, and finely, densely punctate pronotum with short, fine, erect pubescence, allow its separation from other species of similar size (4.5–5.5 mm). The apical two abdominal sternites are very dark brown, in contrast to the rest of the venter, which is reddish brown. The male genitalia are also distinct (Campbell 1971) and were of use to confirm the identifications made in this study. In the United States, the genus contains nearly 100 described species (Aalbu et al. 2002).

NEW MATERIAL AND COLLECTION RECORDS

All specimens reported here are deposited in the collection of the National Museum of Natural History, Smithsonian Institution, Washington, DC (USNM), except those listed as “SBPC,” which are in the collection of Stewart Peck, Ottawa, Canada.



Figs. 1–2. *Hymenorus farri*, dorsal and ventral views, respectively. Specimen from Key Largo, Florida. Scale line = 1 mm.

“MSU,” the collection of Montana State University, Bozeman, Montana, and “ABS,” the Archbold Biological Station, Lake Placid, Florida. I did not search other collections for additional records of *H. farri*; the purpose of this study is to simply call attention to the presence of this species in the United States and other new records at hand. Recently, however, I examined the Florida State Collection of Arthropods, Gainesville, and found no specimens of this species. Following the quoted label data for most collections, field observations and other information on the occurrences are given. Specimens in SBPC were identified by J. M. Campbell and S. B. Peck.

Central American and Mexico.—“BELIZE: Stann Creek Dist., Dangriga, 13–15 June 1981, W. E. Steiner (17); field notes describe (14 June) a series of “alleculines” taken at lights on walls of a hotel on the beach front; a few other specimens (13 and

15 June) were found near the building under leaf litter on sand during the day. These were identified by J. M. Campbell shortly thereafter. Because they represented the only known occurrence of *H. farri* in Middle American mainland, I then searched through several hundred undetermined *Hymenorus* in the USNM collection, finding only these additional two: “B. HONDURAS, Belize, ix 1959, N. L. H. Krauss” (1); “MEXICO, Veracruz, VI.1975” (1, no other data). Most recently, the following specimen was sent to the Systematic Entomology Laboratory, USDA, for urgent identification: “GUATEMALA (origin) at Long Beach, CA, USA, with bananas, 19 March 2003. P. Butsook, Inspector” (1).

Bahamas and Turks and Caicos Islands.—“Bahamas, Andros Island, Stafford Creek, Marks Place, 24.vii.1987, J. Browne, mangrove blk lt. 87-121J” (1, SBPC); same data except “BARC, 28.vii.1987, pasture

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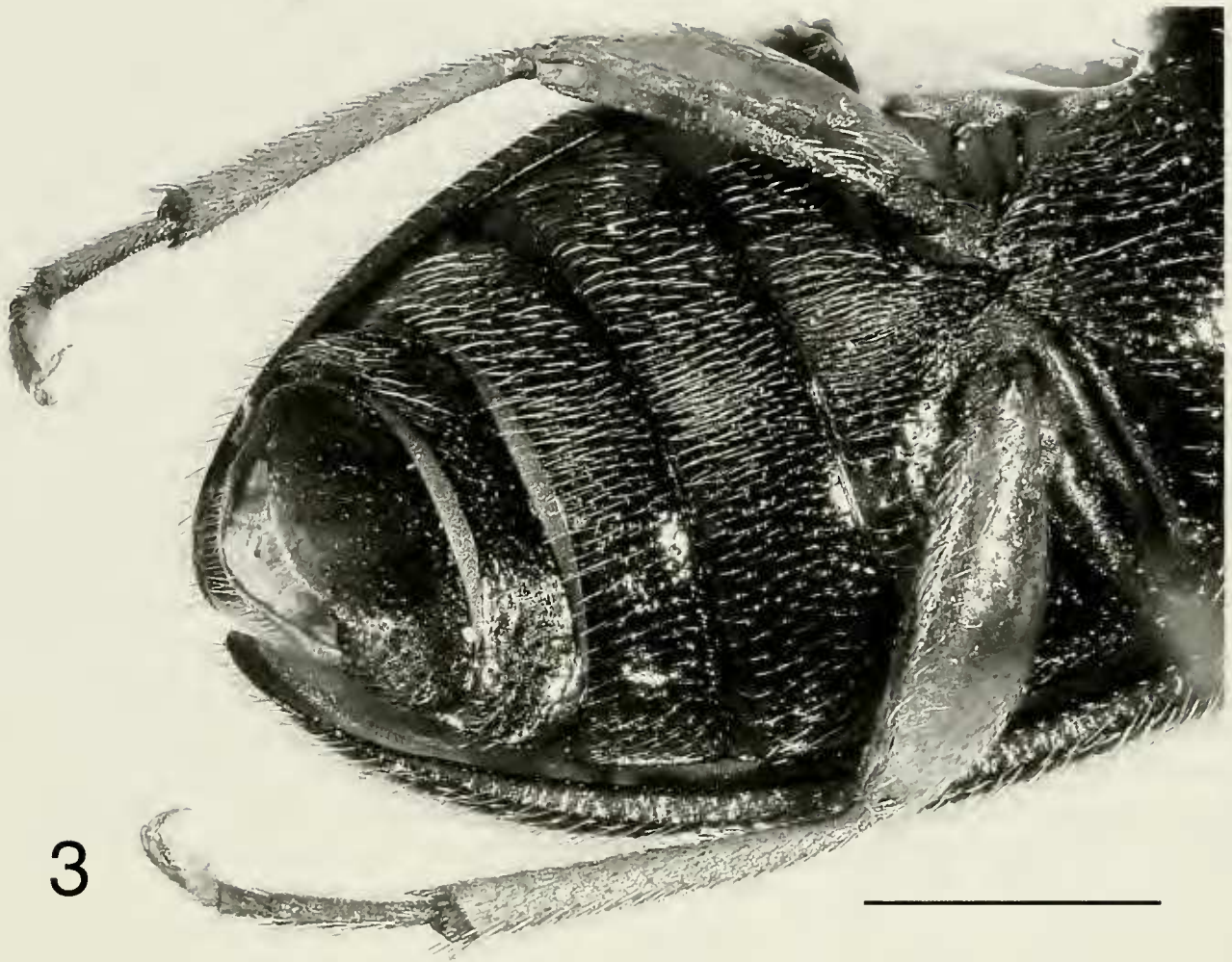


Fig. 3. *Hymenorus farri*, ventral surface of abdomen of male with median patches of setae. Scale line = 1 mm.

edge blk lt, 87-133J" (1, SBPC); same data except "Fresh Creek, Andros Twn, Androsia, 15-06.viii.1987, coppice interior, blk. lt, 87-163J" (1, SBPC); "GRAND BAHAMA ISLAND, Freeport, 20-26 June 1987, W. E. Steiner, M. J. & R. Molineaux" (9); "BAHAMA ISLS., San Salvador, Gerace Research Ctr., 24°07'N, 74°26'W, 20 June 2003, W. E. Steiner & J. M. Swearingen collectors" (1); same data except "21 June" (4) and "22 June" (3); "TURKS AND CAICOS ISLANDS, Providenciales, Grace Bay Beach, 21°48'N, 72°13'W, 26 January 1998/At light in sandy scrub forest; W. E. Steiner & J. M. Swearingen collectors" (1); same data except: "2 February 1998/specimen found dead when collected; in hotel room" (1); same data except: "Under leaf litter on sandy soil at edge of turf and garden" (15). Some of the specimens from Freeport were noted being taken "un-

der leaf litter on sandy loose soil under roadside shrubs" and others collected after dark at fluorescent lights on a building at the same locality. The most recent specimens (San Salvador) were found after dark on stone and concrete walls under mercury vapor lights in open sandy turf among buildings.

Cayman Islands.—"GRAND CAYMAN IS.: 2 mi N of Georgetown, flooded freshwater pond, 26 May 1975, P. J. Spangler" (1); "CAYMAN ISLANDS: Grand Cayman, 3 km W Colliers, 19°21'N, 81°07'W, 21 February 1993/At black light in cut-over forest near ponds; coll. W. E. Steiner & J. M. Swearingen" (12); same data except "On palm leaf at dusk" (1); "CAYMAN ISLANDS: Grand Cayman, Hell, 19°23'N, 81°24'W, 19 February 1993/W. E. Steiner & J. M. Swearingen collectors/Under leaf litter on sandy soil, weedy roadside" (1);

same data except "North Side, 19°21'N, 81°12'W, 22 February 1993/At black light in forest clearing near coast" (2); same data except "Rum Point, 19°22'N, 81°16'W, 22 February 1993/Under leaf litter beneath *Cakile* plants on sand, open edge of dune and pavement" (13) and "24 February 1993/Under dry palm fronds and litter on sandy soil, open mowed flat area near dune and beach" (1). These collections do not represent new island records, but associated notes on the captures add to the knowledge of the insect's habitat. *Hymenorus farri* was collected on all three of the Cayman Islands during a faunal survey in 1938 (Campbell 1978).

Puerto Rico.—"PUERTO RICO, Isla Verde, 27-II-63/A. B. Cochran, on walls & ceilings/San Juan 18388/63-6853" (6); "Isla Verde, P. R., host unknown, A. B. Cochran, 27 Feb. 1963/San Juan 18388, 63-6853" (4); "PUERTO RICO: Isla Verde Airport, I-III-63, A. B. Cochran/San Juan 18458, 63-10499" (1); "P. R., San Juan, Airport, II-15-63, L. T. Sanders/On airport windows, San Juan # 18989, 63-19346" (1); "PUERTO RICO, Naguabo, Playa de Naguabo, 18°11'N, 65°43'W, 17 February 1996, collrs. W. E. Steiner & J. M. Swearingen" (3). Label data on the San Juan Airport collections, all made within a two-week period in 1963, suggest an artificial introduction. Except for the few specimens from Naguabo, no other records for Puerto Rico have been found; this is the only collection made "in the wild" on the island, but it indicates that the beetle is established or indigenous there. Notes made at the Naguabo site indicate specimens were found among beach strand vegetation, in dead leaves on sand among trailing vines in an open sunlit roadside area.

Virgin Islands.—"VIRGIN IS., St. Croix, Est. Mount Fancy, S.E. of Great Pond, 12 JAN 1993, D. S. Sikes, beating mangroves" (2, MSU); same data except "R. S. Miller, beating veget." (1, MSU); "BR. VIRGIN IS: Guana Is., The Flats, nr. Orchard, 13 July 1994, S. A. Bucklin colr.,

leaf & bark litter" (1, MSU); "BR. VIRGIN IS: Guana, Hotel to gardens, 16 OCT 2002, M. A. Ivie colr" (1, MSU); "BR. VIRGIN IS: Guana Is., White Beach, 18°29'N, 64°34'W, 01-17 JUL 1993, R. R. Snelling, Cocoloba coppice" (1, MSU).

United States.—"FLORIDA: Broward Co., Deerfield Beach, North 3rd St., November 5, 1990, Vince Golia, sweeping" [site described (V. Golia, personal communication) as a "vacant trashy lot"] (1, ABS); "FLORIDA: Broward Co., Fort Lauderdale, near Conference Ctr., 26°06'N, 80°07'W, 19 November 2002/W. E. Steiner, N. J. Vandenberg, J. M. Swearingen collectors" [in field notes: "... rough, trashy ground between a hedge & the asphalt, with scattered cabbage palms—bases of these had thick layers of coarse thatch from repeated mowing of weedy strip—more *Blapstinus fortis* under the matted debris, & a few *Hymenorus* sp. poss. *farri* ..."] (3); "FLORIDA: Dade County, Homestead/1 May 1986, W. E. Steiner & D. S. Bogar/Under leaf litter near sidewalk, open turf area" (1); "FLORIDA: Monroe County, Dry Tortugas, Garden Key, 13-15 February 1989/W. E. Steiner, J. M. Hill & J. M. Swearingen collectors" [in field notes (15 Feb. 1989): "Another *Blapstinus fortis*, series of the small pale *Phaleria*, & a few *Hymenorus* sp. under wind-deposited plant debris caught under spreading, isolated plants of the semi-succulent crucifer "sea rocket," *Cakile* sp."] (3); "FLORIDA: Monroe Co., Lower Matecumbe Key, 17 February 1989/W. E. Steiner, J. M. Hill & J. M. Swearingen collectors" [in field notes: "Series of *Hymenorus* under dry leaf litter under trailing 'ice plant' on loose sand beneath shrubs. Not much of a beach here in terms of sand build-up and almost no areas of elevated exposed sand. Probably semi-artificial anyway, being between tidal flats & bank of highway"] (6); "FLORIDA: Monroe County, Lower Matecumbe Key, ocean beach, 24°51'15"N, 80°44'10"W; 21 May 2000, coll. W. E. Steiner & J. M. Swearingen/Under leaf lit-

ter on sand beneath low shrubs of beach strand" (4); "FLORIDA: Monroe County, Key Largo, near Sunset Point, 25°02'45"N, 80°29'45"W, 15 May 2000, coll. W. E. Steiner & J. M. Swearingen/Under matted dry thatch on powdery soil, open mowed field among scattered trees" [in field notes: "... after dark . . . big vacant park-like lot with isolated trees & groves, open mowed sandy flats with leaf litter deep & spongy in some areas—dug into & removed thick top layer to expose dry organic rich powdery soil beneath—got good series of a small *Hymenorus* prob. *farri* . . ."] (41); "FL, Monroe Co., Middle Torch Key, Sec. 17, Lazelle Place, uv light trap, 10–19.viii.1992, S. & J. Peck, 92-315" [site described (S. Peck, personal communication) as "very disturbed, open, weedy, hot and dry"] (19, SBPC); "FLORIDA [Palm Beach Co.], Boynton Beach, 12-VI-1968, F. E. Wood, J. A. Davidson/Collected at black light" (3).

FURTHER OBSERVATIONS AND DISCUSSION

Habits and habitats.—The label data and noted observations show that the beetle occurs primarily at or near the coast in open weedy areas on sand or sandy soil. The larvae probably inhabit sandy substrates, as has been observed for some other species of the genus (Steiner 1995). Adults hide during the day under matted leaf litter, in open areas, but often shaded by shrubs, or at the base of trees. They were especially common in sites of human disturbance—near buildings, weedy roadsides, edges of garden plantings, and areas of coarse turf that receive occasional mowing and where layers of thatch accumulate.

Beetles are fully winged and rapidly take flight when exposed to sunlight on removal of plant debris cover. Nocturnal dispersal by flight is probably typical, however, as supported by the series collected at lights. Feeding has not been observed in *H. farri*, but a single Jamaican specimen is labeled "eating coccids on Agave" (Campbell 1971) with some question as to verity—no

predaceous habits have been observed in alleculines, and this needs further investigation. Adults and larvae are likely to be scavengers on dead plant material and probably fungi on its surfaces; adults of two Panamanian species apparently feed on lichens (Campbell 1962), and some eastern U.S. species chew at lichens on tree trunks at night (WES pers. obs.; in litt.).

Biogeography and detection.—"That the genus *Hymenorus* enjoys but a slight measure of popularity with collectors is undeniable" (Fall 1931). In the many localities newly added above, this may have contributed to the lack of detection of *H. farri* before now. In addition, it seems to "thrive" in habitats that are generally ignored and even avoided by collectors. The distribution of *H. farri* is much wider than originally reported, spanning the northwestern Caribbean and Bahamian regions. Campbell (1971) noted that the *Hymenorus* species of coastal areas tended to be more widespread. This species could be indigenous across its wide range, but because of the greater number of recent collections (very few records prior to 1960) and other characteristics considered here, I believe that the beetle is expanding its range.

Its appearance in Florida is especially telling: it is often common where found, but collection records are unknown prior to 1968. This rather distinct member of the genus likely would not have avoided detection until now, given the historical interest and work done on Florida Coleoptera, as summarized by Peck and Thomas (1998). Had the beetle been present much earlier, the diligent collecting of coleopterists such as E. A. Schwarz and W. S. Blatchley, when the Florida biota was in a pristine condition (Blatchley 1932), followed by the monographic works of Fall (1931) and Campbell (1971) on this genus, should have resulted in its detection. Therefore, it appears to be a recent addition to the U.S. fauna. However, determining native versus immigrant status for insects in southern Florida is particularly problematic (Whitehead and

Wheeler 1990), especially with a species of Antillean distribution. A similar situation involving several species of lygaeoid bugs that are probably recent arrivals to southern Florida in roadside habitats has been noted (Slater 1988). For the more vagile components of the circum-Caribbean lowland insect fauna, over-water dispersal from tropical America to Florida is most likely and accounts for the majority of such species in southern Florida (Peck 1989).

Similarly, *H. farri* seems to be new to Puerto Rico, the Virgin Islands, and Bahamas. *Hymenorus wolcotti* Campbell (1971) has been the only *Hymenorus* species previously known on Puerto Rico; it is abundant in many coastal localities and habitats (Wolcott 1950). A continuing survey of the Coleoptera of the Virgin Islands (Ivie 1996) has accumulated specimens of *H. farri* only during the last decade. Also, no Bahamian specimens were found during Campbell's (1971) detailed study of material collected primarily from 1950 to 1965 on many islands, including the Turks and Caicos. The independent discoveries in 1987 on Andros and Grand Bahama, followed by other collections spanning the Bahamian archipelago, suggest a recent arrival and spread, possibly from Florida and/or Cuba.

The occurrence of *H. farri* on the Central American mainland raises several questions. Does this represent part of its natural range, or has it been recently introduced from the Greater Antilles, where it was first collected and recognized? The earliest collection record (Campbell 1971) is that of a specimen taken by E. A. Schwarz at Cayamas, Cuba; no year is given on Schwarz's specimen label, but his letters (Sherman 1929) indicate he worked there in 1903–1904. The few records from Belize, Guatemala, and Mexico are all based on relatively recent captures. That this species is often common, but not among those described by Champion (1885), suggests a possible spread from the Antilles to Central America in recent decades. However, with so few collection records, this suggestion is

tenuous. In addition, dispersal from islands to mainland is atypical—in fact, the opposite is a more likely scenario, with islands being colonized from mainland populations (Darlington 1938).

The genus *Hymenorus* is Holarctic (Campbell 1971, Papp 1958), but the numerous species treated by Champion (1885) and Fall (1931) indicate that its center of diversity and speciation is by far the arid parts of Mexico and the southwestern United States. A few species are known from Panama (Campbell 1962, 1982) and Brazil, but Campbell (1971) doubted that the latter were *Hymenorus*. Phylogeny among species is unknown; assuming that the genus is monophyletic, it displays mostly a “North American-Caribbean track” (Rosen 1976) of distribution, as does the known distribution of *H. farri* alone. Examples of other insect taxa that inhabit the soil surface also show this pattern, such as the carabid genus *Platynus* (Liebherr 1988) and many Lygaeoidea (Slater 1988). This perhaps supports the idea that *H. farri* is a mainland species that has spread to the Caribbean region. Two other species of *Hymenorus*, both of which also inhabit coastal sands, are nearly as widely distributed as *H. farri* and overlap with much of its range: *H. densus* LeConte, from North Carolina to Florida and the Bahamas (Campbell 1971) and Mexico (Champion 1885; recent collection records in USNM), and *H. convexus* Casey, from southern Florida, Bahamas, Turks and Caicos Islands, Cuba, and Cayman Islands (Campbell 1971, 1978). The latter, however, is not known from mainland Central America and appears to be of Antillean origin; Campbell (1971) stated that it “has spread into Florida from the Bahamas.” Other *Hymenorus* species, including mainland ones, are known from relatively few records and appear to be more precinctive or endemic to one or a few islands (but this could be due to the “collectors’ neglect” mentioned above). *Hymenorus farri* might be naturally widespread and has simply escaped detection across its range until now, but it ap-

pears more likely to be a “weed species” that is spreading (from an uncertain origin, possibly Cuba) with the aid of human activities.

In addition to being an active flier, *H. farri* has characteristics of insects that are likely to be introduced to new regions (Whitehead and Wheeler 1990). Some other adventive tenebrionids inhabit coastal sands and seem prone to accidental introduction (Steiner 1996, 2003, in press). *Hymenorus farri* lives in open, disturbed habitats and is found in the same microsites with other adventive or invasive species (e.g., turf weeds, imported fire ants). It also commonly co-occurs with *Blapstinus fortis* LeConte, a widespread native tenebrionid with a distribution (Davis 1970; WES unpublished data) similar to that of *H. farri*. Natural dispersal via flight and storm winds could have occurred, or, arrival at new lands via commerce, e.g., in soil with ornamental plant stock, is possible, as demonstrated by the recent U.S. port interception of the beetle in a fruit shipment from Central America.

Anthropogenically altered, maintained, open habitats are more easily colonized by species of coastal sandy localities and open scrub, regardless of dispersal method. Removal of native vegetation offers such a species a much greater chance of successful colonization, and the open ground of roadsides provides corridors of dispersal to other areas. Roadside habitats have provided corridors for fire ant dispersal (Taber 2000, Tschinkel 1986). Even some native, flightless species, e.g., the tenebrionid *Opatrinus minimus* (Beauv.), have “weedy” characteristics and may be spreading to new areas, where they are becoming more abundant than in their previous range (Steiner 1999). Future collecting and tracking of individual species in question will better define this continuing blending of biota.

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